

O P E R A T I O N S
Docket No.: 1340-017

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT OPERATIONS

In re Application of:

Shaodong Chen et al.

Serial No.: 10/616,503

Filed: July 9, 2003

)
) Group Art Unit: --
)
) Examiner: --
)
)

For: **TROLLEY MEMBER OF GARAGE DOOR OPENER SYSTEM**

New York, NY 10036
November 10, 2003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CLAIM FOR CONVENTION PRIORITY UNDER 35 U.S.C. §119

SIR:

In the matter of the above-identified application and under the provisions of 35 U.S.C. §119 Inventor(s) claim the benefit of the following prior applications:

Application(s) filed in : China
In the name of Applicant(s) : **Shaodong Chen et al.**
Application No(s). : 02 2 63408.8
Filed : July 26, 2002

Pursuant to the Claim to Priority, Applicant(s) submit duly certified copy of said foreign application.

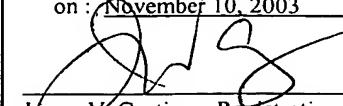
Respectfully submitted,


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10/0161503

Patent Business Agency (Suzhou)

Registered agency in China National Intellectual Property Office (Bureau)
Floor 1st, Technological Building
91 Renmin Road, 215002 Suzhou, China

The Priority Certificate

This certificate is to approve the Priority of following Invention that has been submitted to our office, relative documents see attached.

Filing Date: July 26, 2002
Application No.: 02 2 63408.8
Type of the application: Utility Model
Name of the invention: A trolley for garage door opener system
Applicant: Positec Power Tools (Suzhou) Co., Ltd.
Inventor: Shaodong Chen, Zhao Kong

Approved by:

Mr. Wang Rongchuan

The president of State Intellectual Property Bureau
Of P.R.China
Jun 25th, 2003

Translated and witness by

Mr. Sun Fangwei

The attorney of Patent Business Agency (Suzhou)
Jun. 3rd, 2003



证 明

本证明之附件是向本局提交的下列专利申请副本

申 请 日： 2002 07 26

申 请 号： 02 2 63408.8

申 请 类 别： 实用新型

发明创造名称： 车库门开门器系统的滑车

申 请 人： 苏州宝时得电动工具有限公司

发明人或设计人：陈少东；孔钊

中华人民共和国
国家知识产权局局长

王景川

2003 年 6 月 25 日

权 利 要 求 书

1、一种车库门开门器系统的滑车，包括滑车本体[2]、连接于滑车本体[2]上的连杆[7]，其特征在于：它还包括设置于滑车本体[2]上并与之可转动连接的齿轮轴[3]、设置于滑车本体[2]上并与之滑动连接的齿条[5]，所述的齿轮轴[3]上设有齿轮[9]，齿轮[9]上的齿与齿条[5]上的齿相啮合，所述的齿条[5]与弹性装置相连接；所述的齿条[5]有两种工作状态，第一工作状态是齿条[5]插在链条接头[8]上的凹槽[10]内，并且所述的弹性装置具有使得齿条[5]趋于第一工作状态的趋势，第二工作状态是齿条[5]脱离所述的凹槽[10]。

2、根据权利要求1所述的车库门开门器系统的滑车，其特征在于：所述的弹性装置为扭簧[4]，该扭簧[4]的一端部与滑车本体[2]相连接，扭簧[4]的另一端部与齿条[5]相连接。

3、根据权利要求1所述的车库门开门器系统的滑车，其特征在于：所述的滑车本体[2]上设有扭簧轴[11]，扭簧[4]套在所述的扭簧轴[11]上。

4、根据权利要求1所述的车库门开门器系统的滑车，其特征在于：所述的齿轮轴[3]上设有径向延伸的拉柄[1]，在齿条[5]由第一工作状态向第二工作状态变换时，所述的拉柄[1]的运动的切线方向大致上平行于滑车本体[2]的移动方向。

说 明 书

车库门开门器系统的滑车

技术领域

本实用新型涉及一种车库开门器上的滑车。

背景技术

现有技术中，车库开门器的轨道上设有滑车，滑车通过连杆与车库门相连接，在正常情况下，滑车与链条相连接，电机带动链条移动，则链条带动滑车在导轨内移动，使得滑车带动车库门关闭或打开。在紧急情况下（例如电机断电），需要手动移动车库门，此时需要使滑车与链条相脱离，手动拉动滑车，可带动车库门移动。现有的滑车在两种工作状态下是稳定的工作状态，因此在电机由失电变为得电时，有可能滑车与链条仍处于脱离状态，电机仍会带动链条空转，而不能由链条带动滑车再带动车库门移动。

发明内容

本实用新型的目的在于提供一种使用可靠的车库门开门器系统的滑车。

本实用新型的技术方案是：一种车库门开门器系统的滑车，包括滑车本体、连接于滑车本体上的连杆，它还包括设置于滑车本体上并与之可转动连接的齿轮轴、设置于滑车本体上并与之滑动连接的齿条，所述的齿轮轴上设有齿轮，齿轮的上齿与齿条上的齿相啮合，所述的齿条与弹性装置相连接；所述的齿条有两种工作状态，第一工作状态是齿条插在链条接头上的凹槽内，并且所述的弹性装置具有使得齿条趋于第一工作状态的趋势，第二工作状态是齿条脱离所述的凹槽。

本实用新型与现有技术相比具有下列优点：

通过弹性装置的作用，使得齿条始终趋于第一工作状态，除非手动操作齿轮使得齿条处于第二工作状态，而当松开施加到齿轮上的力时，齿条会自动由第二工作状态进入第一工作状态，则电机能够可靠地带动链条再带动滑车移动，不会出现链条空转的现象。

附图说明

附图1为本实用新型的主视图（附图2的A-A方向剖视图）；

附图2为附图1的俯视图；

附图3为附图1的仰视图；

附图4为附图1的B-B方向剖视图；其中：

[1]、拉柄； [2]、滑车本体； [3]、齿轮轴； [4]、扭簧； [5]、齿条； [6]、

连杆转轴：[7]、连杆：[8]、链条接头：[9]、齿轮：[10]、凹槽：[11]、
扭簧轴：

具体实施方式

参见附图1至附图4，一种车库门开门器系统的滑车，包括滑车本体[2]、连接于滑车本体[2]上的连杆[7]，它还包括设置于滑车本体[2]上并与之可转动连接的齿轮轴[3]、设置于滑车本体[2]上并与之滑动连接的齿条[5]，所述的齿轮轴[3]上设有齿轮[9]，所述的齿轮轴[3]上设有径向延伸的拉柄[1]，在齿条[5]由第一工作状态向第二工作状态变换时，所述的拉柄[1]的运动的切线方向大致上平行于滑车本体[2]的移动方向，如附图3的细线所示。齿轮[9]上的齿与齿条[5]上的齿相啮合，所述的齿条[9]与弹性装置相连接；所述的齿条[5]有两种工作状态，第一工作状态是齿条[5]插在链条接头[8]上的凹槽[10]内，并且所述的弹性装置具有使得齿条[5]趋于第一工作状态的趋势，此时电动机可以带动链条移动，链条上的链条接头[8]带动齿条[5]，由齿条[5]带动滑车本体[2]在轨道上移动，滑车本体[2]上的连杆[7]带动车库门移动。第二工作状态是电动机断电时的紧急工作状态，此时需要转动齿轮轴[3]，使得齿轮[3]上的齿带动齿条[5]移动，则齿条[5]的端部脱离所述的凹槽[10]，滑车本体[2]可以独立带动连杆[7]再带动车库门移动。

所述的弹性装置为扭簧[4]，该扭簧[4]的一端部与滑车本体[2]相连接，扭簧[4]的另一端部与齿条[5]相连接。所述的滑车本体[2]上设有扭簧轴[11]，扭簧[4]套在所述的扭簧轴[11]上。

说 明 书 附 图

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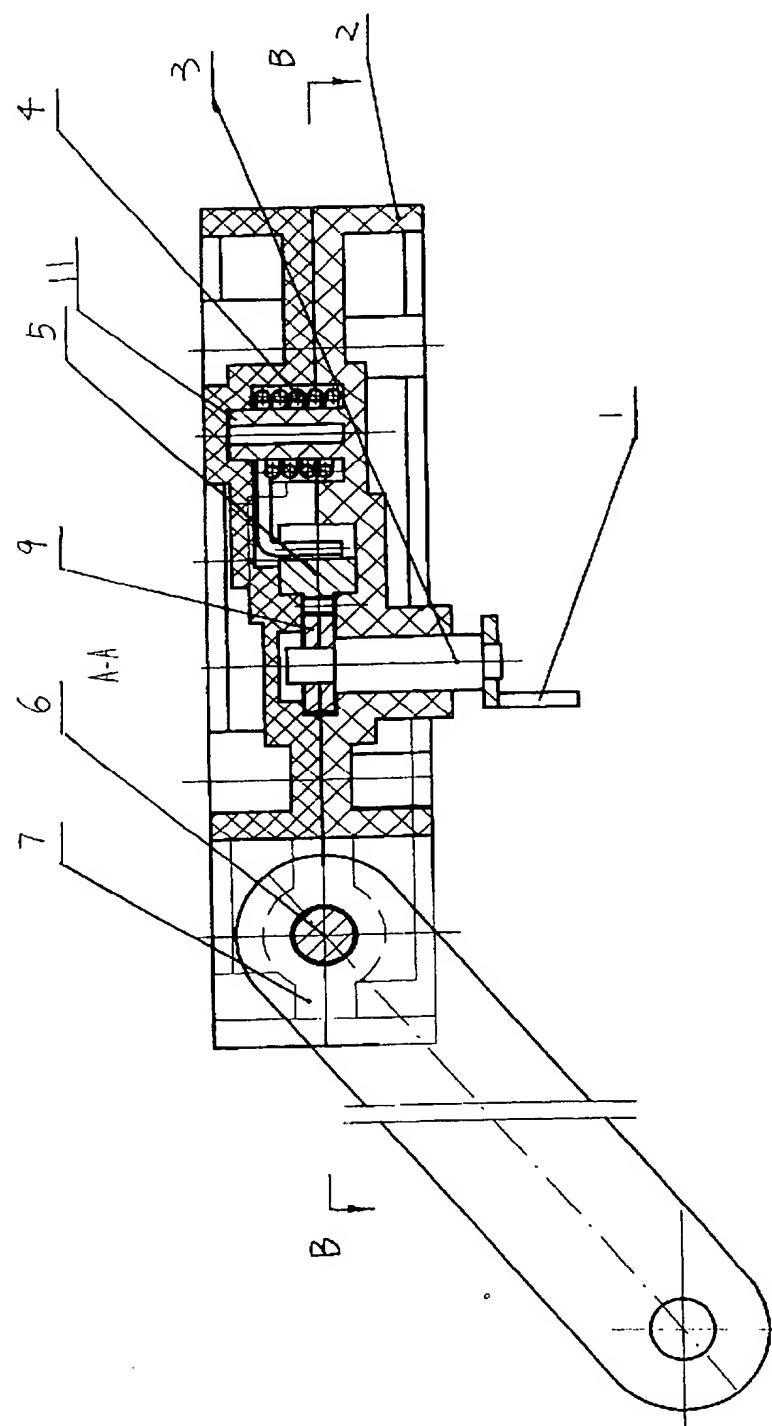


图 1

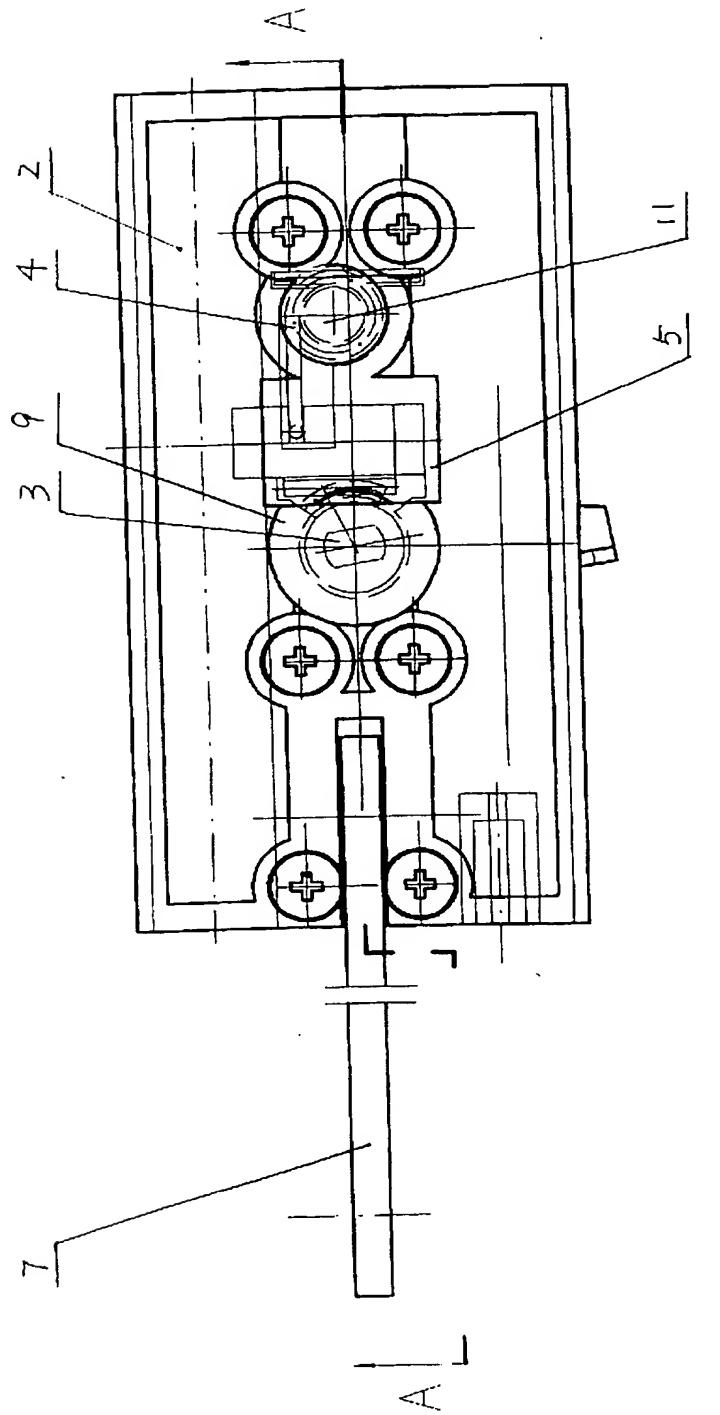
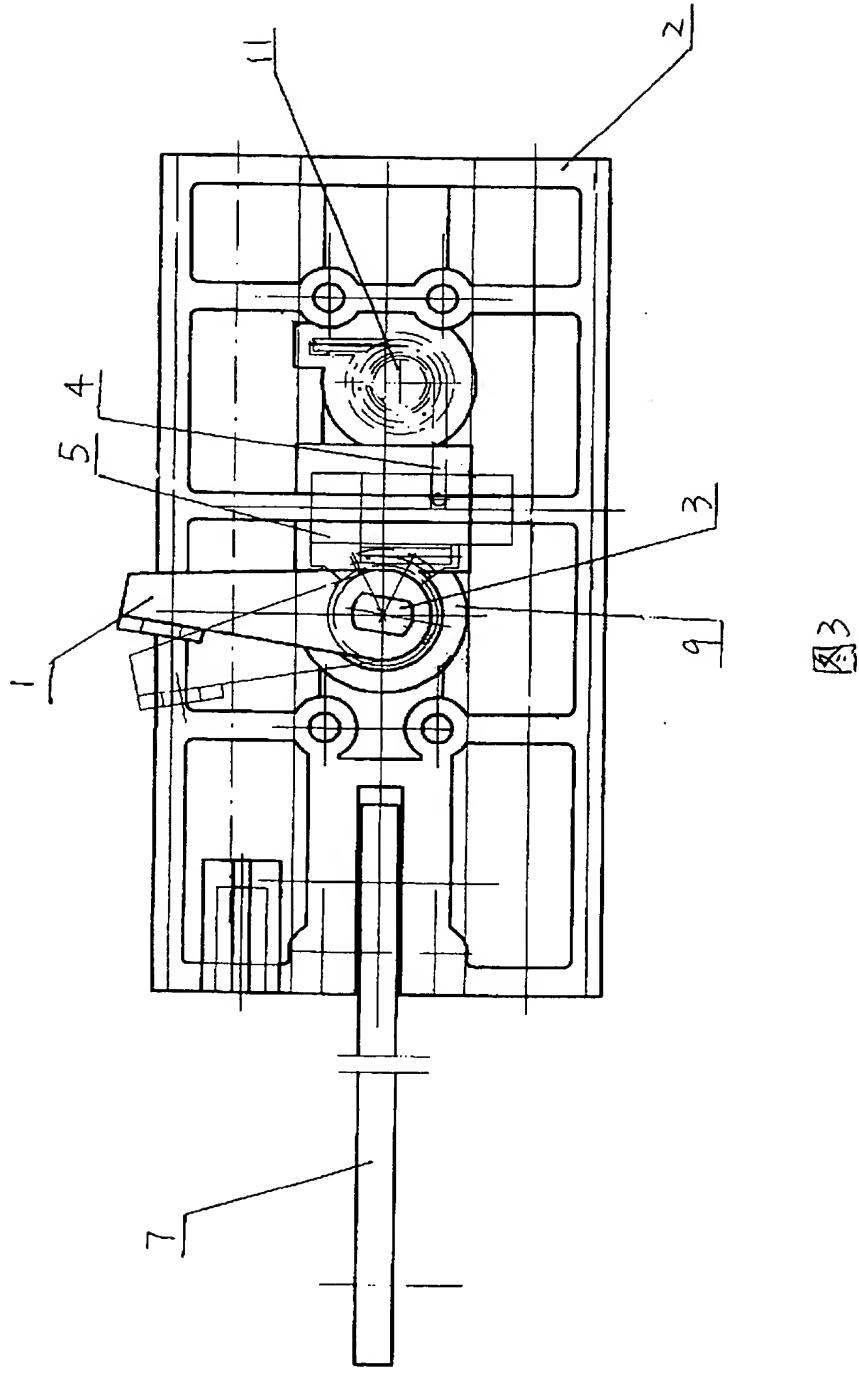
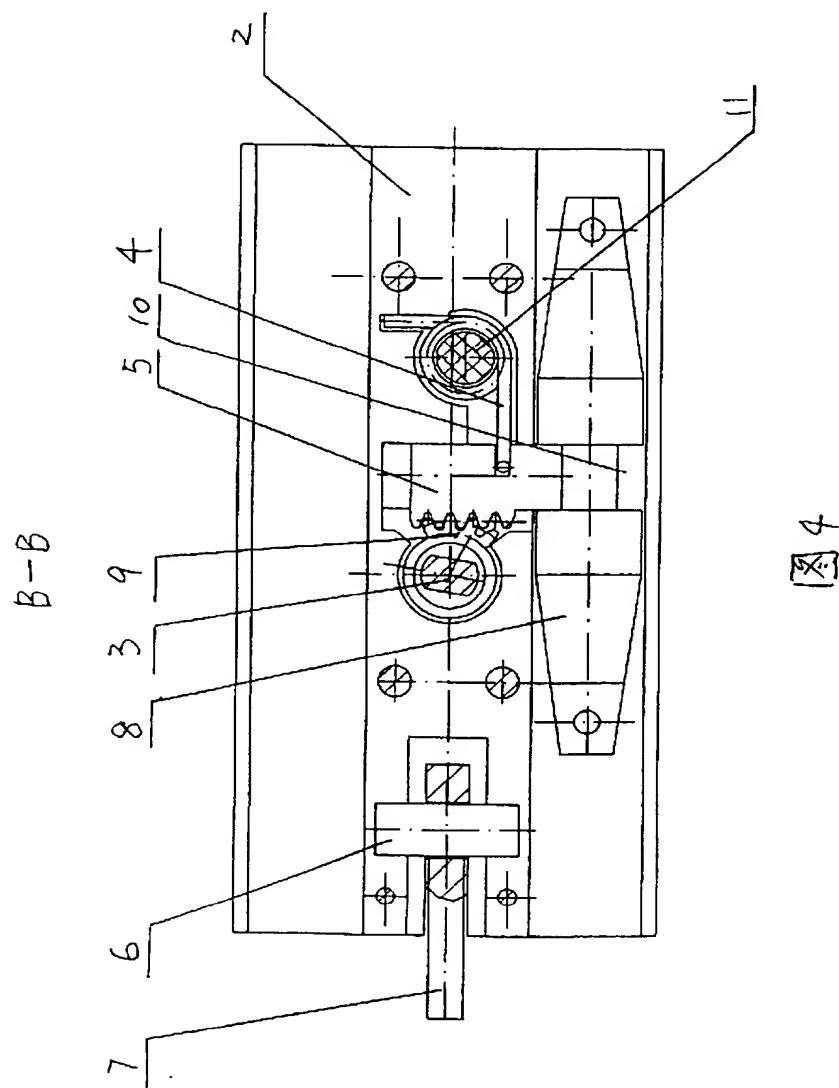


图2



11

10



The title of the patent in Chinese application:

A trolley member of garage door opener system

Applicant:

Positec Power Tools (Suzhou) CO., LTD

Name of the Inventor:

Shaodong, Chen;
Zhao, Kong

Application Number:

02263408.8

Filing Date:

July 26th, 2002

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Translated and witness by

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The attorney of Patent Business Agency (Suzhou)

Jun. 10th, 2003



Abstract:

A trolley member for a garage door opener, comprises a trolley body (2), a connecting rod (7), a gear shaft (3) disposed on the trolley body (2), a rack (5) disposed on the trolley body (2), a gear (9) disposed on the gear shaft (3). The teeth of the gear (9) is engaged with the teeth of the rack (5). The rack (5) is connected to a spring device. The rack (5) has two working status. A first working status is that the rack (5) is inserted into a slot (10) of a chain link (8) and the spring member urges the rack (5) to the first working status, and a second working status is that the rack (5) is detached from the slot (10). The rack (5) is always urged to the first working status by the spring device, thereby the motor can reliably drives the chain and then the trolley member moving, and the chain can not be idling.

Claims:

1. A trolley member for a garage door opener, comprising a trolley body (2), a connecting rod (7) connected to the trolley body, the feature is: the trolley member further comprising a gear shaft (3) disposed on the trolley body (2) and rotatably connected to the trolley body (2), a rack (5) disposed on the trolley body (2) and rotatably connected to the trolley body (2), a gear (9) disposed on the gear shaft (3), teeth of the gear (9) engaged with the teeth of the rack (5), the rack (5) connected

to the a spring device, the rack (5) having two working status wherein a first working status is that the rack (5) is inserted into a slot (10) of a chain link (8) and the spring member urging the rack (5) to the first working status, and a second working status is that the rack (5) is detached from the slot (10).

2. The trolley member according to claim 1, the feature is: the spring member is a torsion spring (4), one end of the torsion spring is connected to the trolley body (2), the other end of the torsion spring is connected to the rack (5).
3. The trolley member according to claim 1, the feature is: the trolley body (2) includes a torsion spring shaft (11), and the torsion spring (4) is enclosed on the torsion spring shaft (11).
4. The trolley member according to claim 1, the feature is: the gear shaft (3) comprises a pulling handle (1) radially extended, the tangent direction of the movement of the pulling handle (1) is substantively parallel to the moving direction of the trolley body (2).

Specification

Field of the invention:

The present utility relates to a trolley member of a garage door opener.

Background of the invention:

In the existing technology, the rail of the garage door opener arranges a

trolley member which is connected to the garage door by a connecting rod. In normal condition, the trolley is connected to the chain, and the motor drives the chain moving, thus, the chain drives the trolley member moving in the rail which causes the garage door opening or closing. In the urgency condition (such as the motor is broken), the garage door is moved by manual, and at the same time, the trolley member is needed to detach from the chain, thus, the manual causes the garage door moving. The existing trolley member has two steady working status, so once the motor is changed from power off to power on, the trolley member may still be detached from the chain, thereby the motor can drive the idling chain, and the chain can not be driven to moving the trolley and then the garage door.

Summary of the invention:

The object of the present utility is to provide a trolley member of the garage door opener which is used reliably.

The technology project of the present utility is: A trolley member for a garage door opener comprising a trolley body, a connecting rod connected to the trolley body, the trolley member further comprising a gear shaft disposed on the trolley body and rotatably connected to the trolley body, a rack disposed on the trolley body and rotatably connected to the trolley body, a gear disposed on the gear shaft , teeth of the gear

engaged with the teeth of the rack, the rack connected to the a spring device, the rack having two working status wherein a first working status is that the rack is inserted into a slot of a chain link and the spring member urging the rack to the first working status, and a second working status is that the rack is detached from the slot.

The present utility has advantages below with respect to the existing arts: The rack is always urged to the first working status by the spring device, unless the gear is operated by manual to cause the rack is in the second working status. When the force applied to the gear is released, the rack is automatically changed from the second working status to the first working status, therefore the motor reliably drives the chain and then the trolley member moving, and the chain can not be idling.

Brief description of the drawings:

Fig. 1 is a front view of the present utility (cross-section view taken along A-A direction of Fig. 2);

Fig. 2 is a top view of Fig. 1;

Fig. 3 is a bottom view of Fig. 1;

Fig. 4 is a cross-section view taken along B-B direction of Fig. 1; wherein:

(1) pulling handle; (2) trolley body; (3) gear shaft; (4) torsion spring; (5) rack; (7) connecting rod; (8) chain link (9) gear; (10) slot; (11) torsion

spring shaft.

Detailed description of the embodiment:

Referring to Figs. 1 to 4, a trolley member for a garage door opener, comprises a trolley body (2), a connecting rod (7) rotatably connected to the trolley body (2). The trolley member further comprises a gear shaft (3) disposed on the trolley body (2) and rotatably connected to the trolley body (2). A rack (5) is disposed on the trolley body (2) and rotatably connected thereto. A gear (9) is disposed on the gear shaft (3), The gear shaft (3) includes a pulling handle (1) radially extended. When the rack (5) is changed from a first working status to the second working status, the tangent direction of the movement of the pulling handle (1) is substantively parallel to the moving direction of the trolley body (2). As shown in Fig. 3, the teeth of the gear (9) is engaged with the teeth of the rack (5). The rack (5) is connected to the spring device, and has two working status. A first working status of the rack (5) is that the rack (5) is inserted into a slot (10) of a chain link (8) and the spring member urges the rack (5) to the first working status, and at the same time, the motor drives the chain moving, the chain link (8) drives the rack (5), the rack (5) drives the trolley body (2) moving in the rail, and the connecting rod (7) of the trolley body (2) drives the garage door moving. A second working status is an urgent working status of the motor with power off, and the gear shaft (3) needs to be rotated on the pulling handle (1) which causes

the teeth of the gear (3) driving the rack (5) moving; thus, one end of the rack is detached from the slot (10).

The spring member is a torsion spring (4), one end of the torsion spring is connected to the trolley body (2), and the other end of the torsion spring is connected to the rack (5). The trolley body (2) includes a torsion spring shaft (11), and the torsion spring (4) is enclosed on the torsion spring shaft (11).